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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/594,679

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EXAMINER

KENNEDY, TIMOTHY J

ART UNIT

PAPER NUMBER

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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/594,679	<b>Applicant(s)</b> AOKI ET AL.	
	<b>Examiner</b> TIMOTHY KENNEDY	<b>Art Unit</b> 1791	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 28 September 2006.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-9 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-9 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 September 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>9/28/2006</u> .   | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Claim Objections***

1. Claims 6 and 9 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form.
2. Claims 6 and 9 are directed towards a product. The language used in these two claims describe products produced from the pellets and do not further describe the pellet making process or the composition of the pellet, thus claims 6 and 9 fail to further limit the process of making a resin composition pellet.

### ***Claim Rejections - 35 USC § 112***

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.
4. Claims 1-9 rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
5. Regarding claim 1, the differentiation between the fiber length (l) and the fiber length (L) should be stated more clearly. The Examiner is interpreting it to mean that during the extrusion process the fiber length (L) is shortened into the fiber length (l) in the final pelletized composition.
6. Further regarding claim 1, the terms (x) and (1-x) are unclear as to whether or not the values are percentages or known value, clarification is needed.

Art Unit: 1791

7. Finally regarding claim 1, the phrase "backward in an extrusion direction" is vague since when viewed in terms of Figure 1 the "side-feed port" is upstream from the "main feed port". The Examiner is interpreting "backward in an extrusion direction" as forward in an extrusion direction.

***Claim Rejections - 35 USC § 103***

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

10. Claims 1, 3, and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Koizumi et al (5,883,159), in view of and Hawley (U.S. Patent 5,185,117).

Regarding claim 1:

11. A method for producing a resin pellet composition in which a weight average fiber length (I) of a fibrous filler (B) is 180 to 360  $\mu\text{m}$

Art Unit: 1791

12. Koizumi et al teach creating an extruded product that has glass fibers with an average fiber length of 400-800  $\mu\text{m}$  (column 6, lines 32-42). Regarding the term pellet, it is well within the bounds of a skilled artisan to extrude any needed shape using the same resin composition. Even though Koizumi et al do not teach the exact fiber length range, it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable range involves only routine skill in the art. *In re Aller*, 220 F.2d 454, 456, 105 USPQ 233, 235.

13. Further regarding claim 1:

14. Comprising supplying 80 to 55% by weight of resin (A) and 20 to 45% by weight of the fibrous filler (B) with a weight average fiber length (L) of 1 mm or more to an extruder

15. Koizumi et al teach the use of resin and two types of glass fibers. The mixture consists of 65% resin and 35% glass fiber (column 4, lines 11-20). The two types of fibers have a starting length of at least 1 mm (column 5, lines 1-5 and lines 23-33)

16. Koizumi et al do not teach:

17. A part of an amount (x) of the resin (A) is supplied through a main feed port of the extruder

18. The fibrous filler (B) and a remaining amount (1-x) of the resin (A) are supplied through a side-feed port provided [forward] in an extrusion direction from the main feed port so that x/(1-x) becomes 50/50 to 10/90% by weight.

19. In the same field of endeavor Hawley teaches the use of an extruder with a main feed port and a secondary feed port, which is located forward in an extrusion direction

Art Unit: 1791

from the main port (Figure 1, parts 38 and 82). Using Hawley's method 100% of the resin is loaded into the main feed port and 100% of the fiber is loaded into the second feed port (Abstract). However, it would have been obvious to try different variations of the amount of resin introduced into the two ports to control the degradation of the fibers. It has been shown that a person of ordinary skill has good reason to pursue the known options in their art. If this lead to an anticipated success, it is likely that it was not due to innovation but of ordinary skill and common sense. *KSR International Co. v. Teleflex Inc.*, 82 USPQ2d 1385, 1397 (2007)

20. It would have been obvious to one having ordinary skill in the art at the time the invention was made to use the extrusion method of Hawley, using the Koizumi et al method, since it would be possible to control the fiber degradation, thus producing the needed final fiber length.

21. Regarding claim 3, Hawley, for the reasons stated previously, teaches:

22. The resin composition is obtained by a one-pass treatment with the extruder

23. Hawley does not explicitly describe his extrusion process as "one-pass", but one skilled in the art would recognize that his process was "one-pass" since the extrudate moves to other processing apparatuses (Abstract). No other extrusion is used on Hawley's resin/fiber composite. Regarding the term pellet, it is well within the bounds of a skilled artisan to extrude any needed shape using the same resin composition.

24. Regarding claim 5, Koizumi et al further teach:

25. The fibrous filler (B) comprises at least one of a glass fiber (column 5, lines 1-5 and lines 23-33) and a carbon fiber

Art Unit: 1791

26. Regarding claims 6 and 9:

27. Since Koizumi et al and Hawley teach the method of claim 1, which is a method of producing a resin composition pellet, one skilled in the art would understand that the resin composition pellet would be able to produce the products with their respective properties claimed in claims 6 and 9.

28. Claim 2 rejected under 35 U.S.C. 103(a) as being unpatentable over Koizumi et al and Hawley as applied to claim 1 above, and further in view of Seiichi et al (Japan Published Application 06240114: Already of Record). Regarding claim 2, Koizumi et al and Hawley do not teach:

29. A proportion of the fibrous filler (B) with a fiber length exceeding 300  $\mu\text{m}$  in the resin composition pellet is 5 to 40% by weight.

30. In the same field of endeavor Seiichi et al teach that up to 15% by weight of the fibers have a length of 1 mm or more (English Abstract).

31. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have the proper percentage of fibers over 300  $\mu\text{m}$  as taught by Seiichi et al, using the previous method of Koizumi et al and Hawley, due to the fact that long fibers are harder to disperse properly in the resin, thus reducing the quality of the composite.

32. Claims 4 and 8 rejected under 35 U.S.C. 103(a) as being unpatentable over Koizumi et al and Hawley as applied to claim 1 above, and further in view of Waggoner et al (U.S. Patent 5,110,896). Regarding claim 4, Koizumi et al and Hawley do not teach:

Art Unit: 1791

33. The resin comprises a liquid crystalline polymer

34. In the same field of endeavor Waggoner et al teach the use of liquid crystalline polymer with fiber reinforcement.

35. It would have been obvious to one having ordinary skill in the art at the time the invention was made to use the liquid crystalline polymer of Waggoner et al, using the previous method of Koizumi et al and Hawley since liquid crystalline polymer are known for their mechanical and thermal properties, for use in electrical applications.

36. Regarding claim 8, Waggoner et al, for the previously stated reason, teach:

37. A melt viscosity of the resin composition pellet is 10 to 55 Pa\*s (column 6, lines 61-67)

38. Claim 7 rejected under 35 U.S.C. 103(a) as being unpatentable over Koizumi et al and Hawley as applied to claim 1 above, and further in view of Seiichi et al (english machine translation) and Baba (U.S. Patent 5,149,486). Regarding claim 2, Hawley, for the reasons stated previously teaches:

39. A screw has a plasticizing zone and a kneading zone (plasticizing of the resin occurs in resin extruder 4 in Figure 3, and kneading (the mixing of the plasticized resin and fibers) occurs in compounding extruder 8 in Figure 3)

40. The side-feed port is positioned on a downstream side of the plasticizing zone (Figure 1 and 3, parts 38 and 82)

41. Koizumi et al and Hawley do not teach:

42. The extruder comprises a twin-screw extruder



Art Unit: 1791

43. In the same field of endeavor Seiichi et al teach a biaxial extrusion machine (paragraph 0033, page 11). The Examiner is treating the biaxial extrusion machine to be a twin-screw extruder.

44. It would have been obvious to one having ordinary skill in the art at the time the invention was made to use a twin-screw extruder as taught by Seiichi et al, using the previous method of Koizumi et al and Hawley, since it would speed up the production of the resin/fiber composition since two screws would chop the fibers faster than one screw.

45. Koizumi et al, Hawley, and Seiichi et al do not teach:

46. A ratio between screw length and a screw diameter (L/D) is 20 or more

47. In the same field of endeavor Baba teaches mixing liquid crystalline polymer and carbon fiber with an extruder having a L/D ratio of 30 (column 3, lines 58-64)

48. It would have been obvious to one having ordinary skill in the art at the time the invention was made to use the L/D ratio of Baba, using the previous method of Koizumi et al, Hawley, and Seiichi et al. The claiming of an L/D ratio is entirely dependent on the extruder used and the processing needed, but is known in the art that longer lengths provides for better mixing of the components that are in the extruder.

### ***Conclusion***

49. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

50. U.S. Patent 4,213,747: Plasticizing and kneading zone

51. JP06238655: Loading zones

Art Unit: 1791

Any inquiry concerning this communication or earlier communications from the examiner should be directed to TIMOTHY KENNEDY whose telephone number is (571) 270-7068. The examiner can normally be reached on Monday to Friday 9:00am to 6:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Joseph Del Sole can be reached on (571) 272-1130. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

tjk

/Joseph S. Del Sole/  
Supervisory Patent Examiner, Art Unit 1791